

Mathematics

COMPUTER VISION APPLICATIONS ASSOCIATED WITH EUCLIDIAN
SIGNATURE CURVE STATISTICS

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The field of computer vision is a dynamic and changing area that presents many opportunities to a wide variety of researchers. There are opportunities in the field of computer science to build machines and programs that are capable of carrying out computer vision related tasks. In addition, there are many opportunities in the field of mathematics, which focus on the analysis of numeric information behind computer vision applications. Although, much work in different areas of mathematics has been done to analyze computer vision problems, the technique of using a unique graph known as a “signature curve” has become the most popular. The type of signature curve that I focused on in my research is called a “Euclidean signature curve.” This type of signature curve is used to model the outline of any object and provide a way for a computer to identify that object.

However, a large amount of research has already been completed on Euclidean signature curves, therefore, my research focuses on a way to uniquely describe the signature curve to the computer using mathematics as a basis. One way to approach this is by analyzing signature curves using statistics. Statistical measurements such as

standard deviation and variance provide unique numbers that can represent each curve.

My goal was to find patterns in this statistical data in order to formulate a way for computers to more easily recognize the signature curve for a given object. Thus far in my research, I have come across several interesting statistical patterns that have the potential of making computer vision applications more efficient. In addition, my research coupled with future computer vision breakthroughs could aid in the development of artificial intelligence or a similar future technology.